SECP2523: DATABASE
SEM I 2024/2025

DATABASE DESIGN DESCRIPTIONS: CONCEPTUAL DATABASE DESIGN

FOR KKK Online System

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1 Introduction

KADA Company's traditional manual system for membership registration and loan applications presents challenges such as the need for physical presence and security risks. An online system is introduced to modernize these processes, providing a more secure, efficient and user-friendly solution for all stakeholders.

1.1 Overview about the company

Koperasi Kakitangan Daerah Kelantan Berhad (KADA) is a significant cooperative in Malaysia established to provide financial services and social services to the employees of the Lembaga Kemajuan Pertanian Kemubu and its members. The cooperative plays an important role in enhancing the economic well-being of its members through its savings, loan facilities and share services, exemplifying the principles of member ownership, democratic control and mutual benefit.

1.2 Problems

The current manual system used by the KADA company has many challenges. Offline registration requires user presence, resulting in inefficiencies and inconvenience for new and existing members wishing to apply for loans. The system is prone to unauthorized access due to unprotected paper-based documents, putting important data at risk. Physical storage of records increases the risk of data loss due to damage, theft or deterioration. Additionally, staff members deal with heavy administrative load when reports cannot be generated automatically, which may lead to mistakes and delays in decision-making. Lastly, the lack of an automated system limits the company's ability to efficiently track and evaluate its financial performance.

1.3 Proposal

The proposed solution is to transition KADA's current manual system to an online platform. This modernized system will address the needs of new users, administrators, loan applicants and board managers by offering secure access, automating data collection and providing role-based permissions. The system will track user activities and log all operations, ensuring data security and preventing information theft. It also supports continuous updates to enhance functionality and security. Operationally, the online system offers convenience by enabling users to register, apply for loans and generate reports from anywhere at any time. This shift will reduce the administrative burden and improve the efficiency of the company's financial management.

1.4 Definitions, Acronyms and Abbreviations

This section provides the definitions of all terms, acronyms, and abbreviations required to interpret this documentation.

KADA	*Lembaga Kemajuan Pertanian Kemubu*
KKK	*Koperasi Kakitangan Daerah Kelantan Berhad.*
SD	*System Documentation*
ISO/IEC	*International Organization for Standardization/International Electrotechnical Commission*
IEEE	*Institute of Electrical and Electronics Engineers*
TLS	*Transport Layer Security*
WPA	*Wi-Fi Protected Access*
UTC	*Coordinated Universal Time*

2 Database System Requirement

This section outlines the database system requirement, including system modules, specific transaction requirements and local conceptual data models for each module.

2.1 System Overview

The current version of the KKK Online System is to improve cooperative procedures such as member registration, loan application management, administrative tasks, approval tracking and financial reporting. By digitising manual processes and enabling online registration, loan applications and approval tracking, it improves accessibility and efficiency. Board members look over and approve applications, while administrators manage data and policies.

Figure below shows the use case of the KKK Online System.

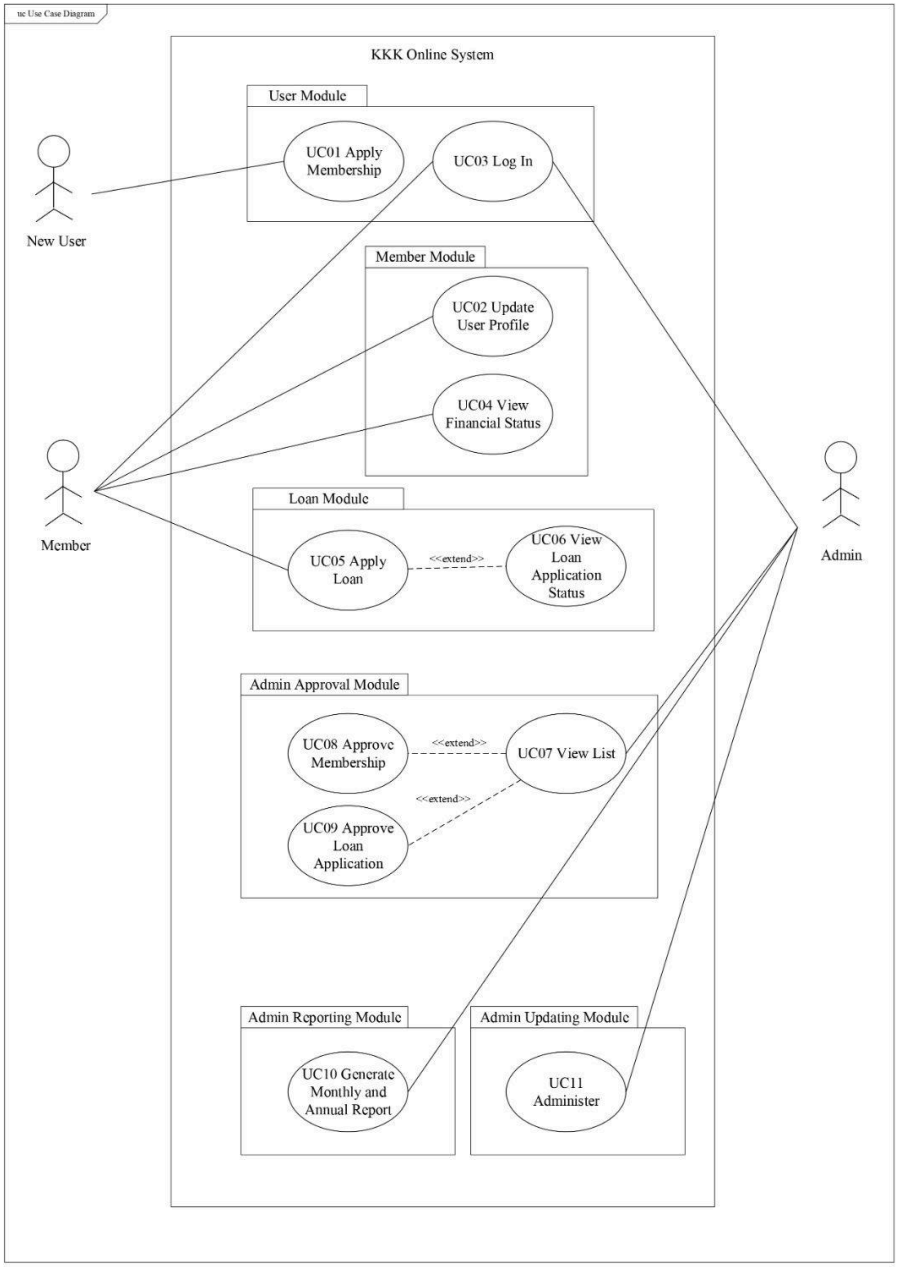

Figure 1.1 use case diagram for KKK online system

2.2 Module User

Lam Yoke Yu is responsible for documenting this module.

2.2.1 Module Description

This module involves actor User and Admin. There are 2 use cases in this module, namely UC01 Apply Membership and UC03 Login.

UC01 Apply Membership
The employees in KADA can apply to be a member of the KKK cooperative by filling in the online form and upload any required documents.

UC03 Login
The cooperative member and the administrator can log in the system by using the correct login credentials. The members will then be directed to the member's page and the administrator will be directed to the administrator's page.

2.2.2 Transaction Requirement: Data Entry

Enter the details for the member application.
Enter the login credential of the user.

2.2.3 Transaction Requirement: Data Update/Deletion

Update the details of a member.

2.2.4 Transaction Requirement: Data Queries

Identify the user type based on the login credentials from data entry.

2.2.5 Local Conceptual Data Model (ERD)

The local conceptual data model (ERD) of the admin reporting module is shown in Figure 1.2.

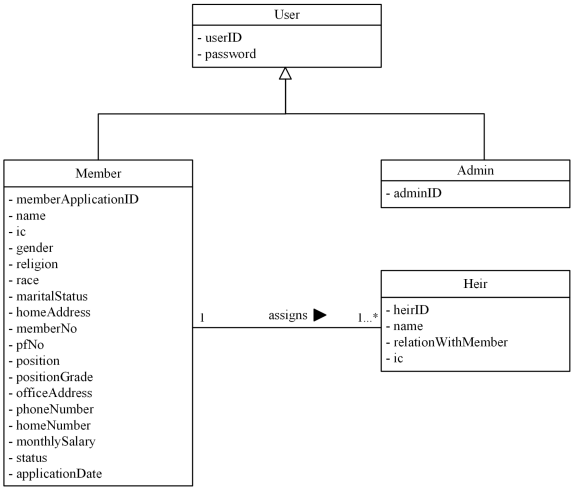

Figure 1.2 local conceptual data model for User module

2.3 Module Member

Goe Jie Ying is responsible for documenting this module.

2.3.1 Module Description

This module involves actor User. There are 2 use cases in this module, namely UC02 Update User Profile and UC04 View Financial Status.

UC02 Update User Profile
KKK members can check and update their personal information, family, and inheritor details by modifying the relevant fields in their profile.

UC04 View Financial Status
KKK members can view their financial status, including share information and loan details.

2.3.2 Transaction Requirement: Data Entry

The module does not support direct data entry. All data used in the reports is retrieved from existing system records.

2.3.3 Transaction Requirement: Data Update/Deletion

Update the user profile.
Delete outdated or incorrect user information.

2.3.4 Transaction Requirement: Data Queries

Retrieve user profile information.
Retrieve financial status.

2.3.5 Local Conceptual Data Model (ERD)

The local conceptual data model (ERD) of the member module is shown in Figure 1.3.

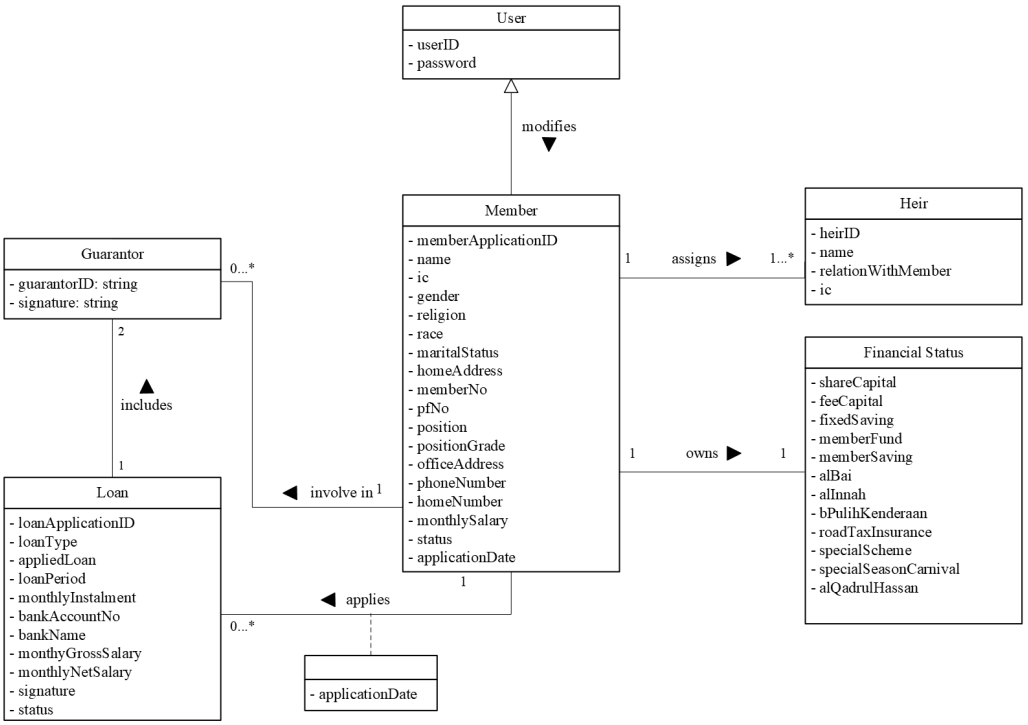

Figure 1.3 local conceptual data model for Member module

2.4 Module Loan

Tan Yi Ya is responsible for documenting this module.

2.4.1 Module Description

This module involves the process of loan handling. There are two use cases involved in this module, which are UC03 Apply Loan and UC04 View Loan Application Status.

2.4.2 Transaction Requirement: Data Entry

UC03 Apply Loan
Enter the user information such as member number, bank account number and bank name.
Enter loan information such as loan type, loan amount, loan period.
Enter salary information such as monthly gross salary and monthly net salary.

UC04 View Loan Application
Does not support direct data entry.

2.4.3 Transaction Requirement: Data Update/Deletion

Update the user information such as bank account number and bank name.
Update the salary of the user.

2.4.4 Transaction Requirement: Data Queries

UC04 View Loan Application
Display the amount of monthly installment needed to be paid by the user.
Retrieve the loan application id.
Retrieve the application date of loan application by the user.

2.4.5 Local Conceptual Data Model (ERD)

The local conceptual data model (ERD) of the loan module is shown in Figure 1.3.

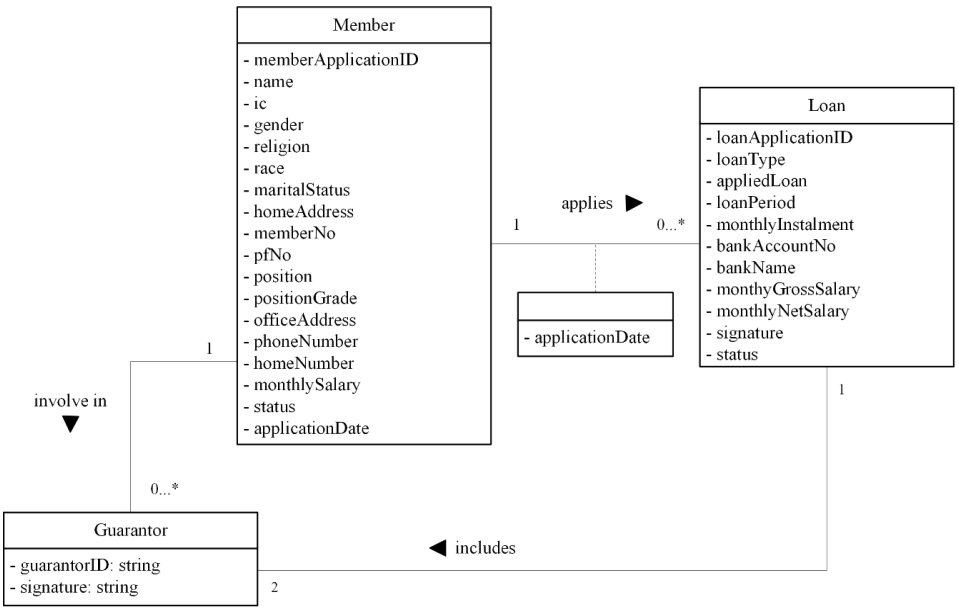

Figure 1.4 local conceptual data model for Loan module

2.5 Module Admin Approval

Chua Jia Lin is responsible for documenting this module.

2.5.1 Module Description

This module involves actor Admin. There are 3 use cases inside this module, which are UC07 View List, UC08 Approve Membership, and UC09 Approve Loan Application.

UC07 View List
In this use case, admins are able to view the list of membership and loan applications as well as the existing members and borrowers.

UC08 Approve Membership
In this use case, admins are able to update the status of the membership application, either "Diterima", "Ditolak", or "Sedang Diproses".

UC09 Approve Loan Application
In this use case, admins are able to update the status of the loan application, either "Diterima", "Ditolak", or "Sedang Diproses".

2.5.2 Transaction Requirement: Data Entry

The module does not support direct data entry. All data required are retrieved from existing system records.

2.5.3 Transaction Requirement: Data Update/Deletion

The module supports:

UC07 View List: Does not support data update/deletion.

UC08 Approve Membership: Update status of membership application.

UC09 Approve Loan Application: Update status of loan application.

2.5.4 Transaction Requirement: Data Queries

The module supports retrieval of:

- List the membership list (including member number, name, and approval date).
- List the loan borrower list (including member number, name, amount of loan borrowed, and approval date).
- List the membership applicant list (including member application id, name, status of application, and application date).
- List the loan applicant list (including loan application id, name, status of application, and application date).

2.5.5 Local Conceptual Data Model (ERD)

The local conceptual data model (ERD) of the admin approval module is shown in Figure 1.5.

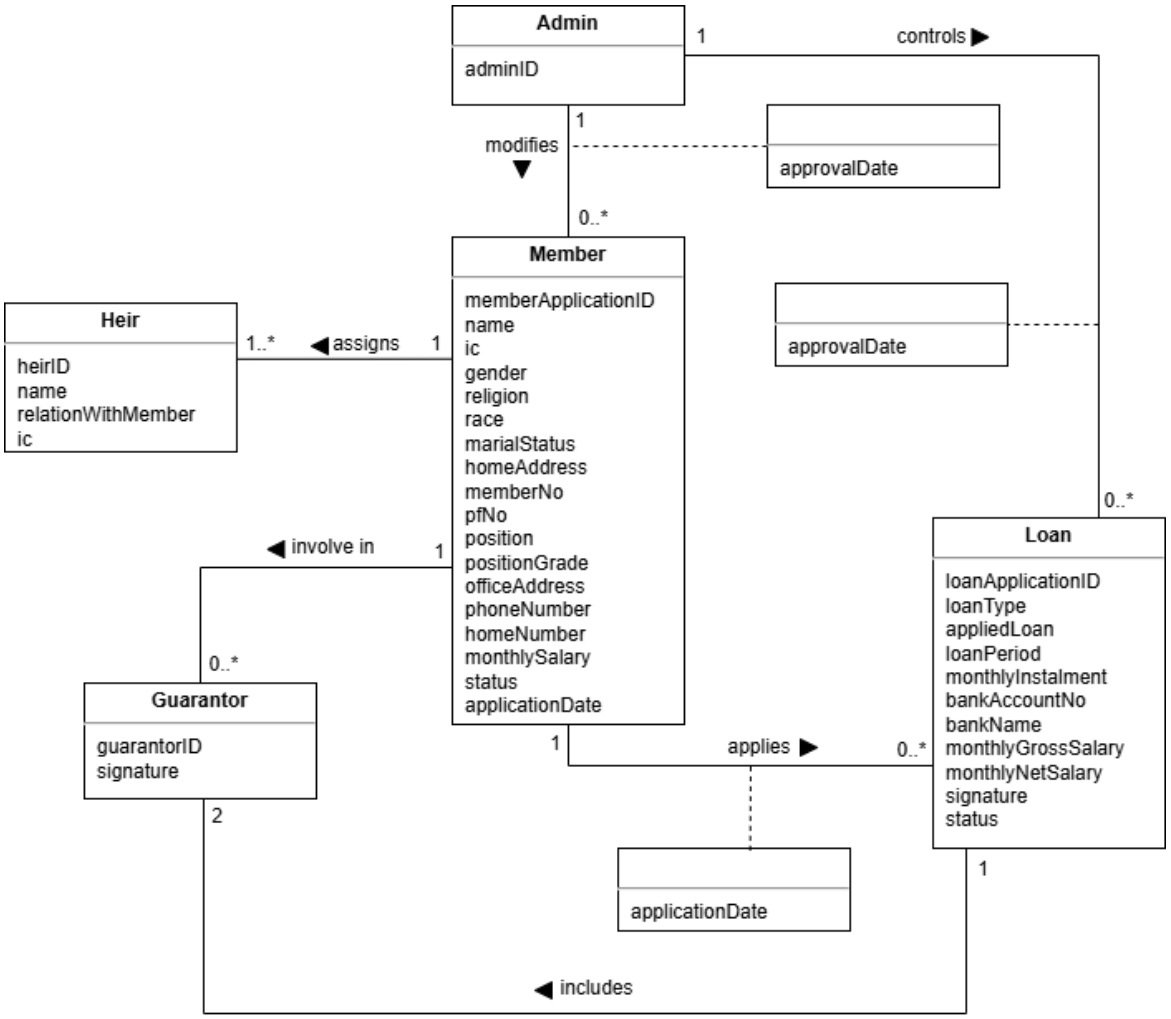

Figure 1.5 local conceptual data model for admin approval module

2.6 Module Admin Updating

Teh Ru Qian is responsible for documenting this module.

2.6.1 Module Description

This module involves actor Admin. There are 1 use case inside this module, which is UC11 Administer.

UC11 Administer

The administrator updates and maintains system records and configurations to ensure accurate transaction data, policy changes and dynamic updates.

2.6.2 Transaction Requirement: Data Entry

The module does not support direct data entry. All data required are retrieved from existing system records.

2.6.3 Transaction Requirement: Data Update/Deletion

Update share capital in member profiles
Update loan interest rates
Update website banners
Delete outdated or incorrect records

2.6.4 Transaction Requirement: Data Queries

Retrieve member profiles and financial details
Retrieve financial status
Retrieve existing policies
Retrieve existing banners

2.6.5 Local Conceptual Data Model (ERD)

The local conceptual data model (ERD) of the admin updating module is shown in Figure 1.6.

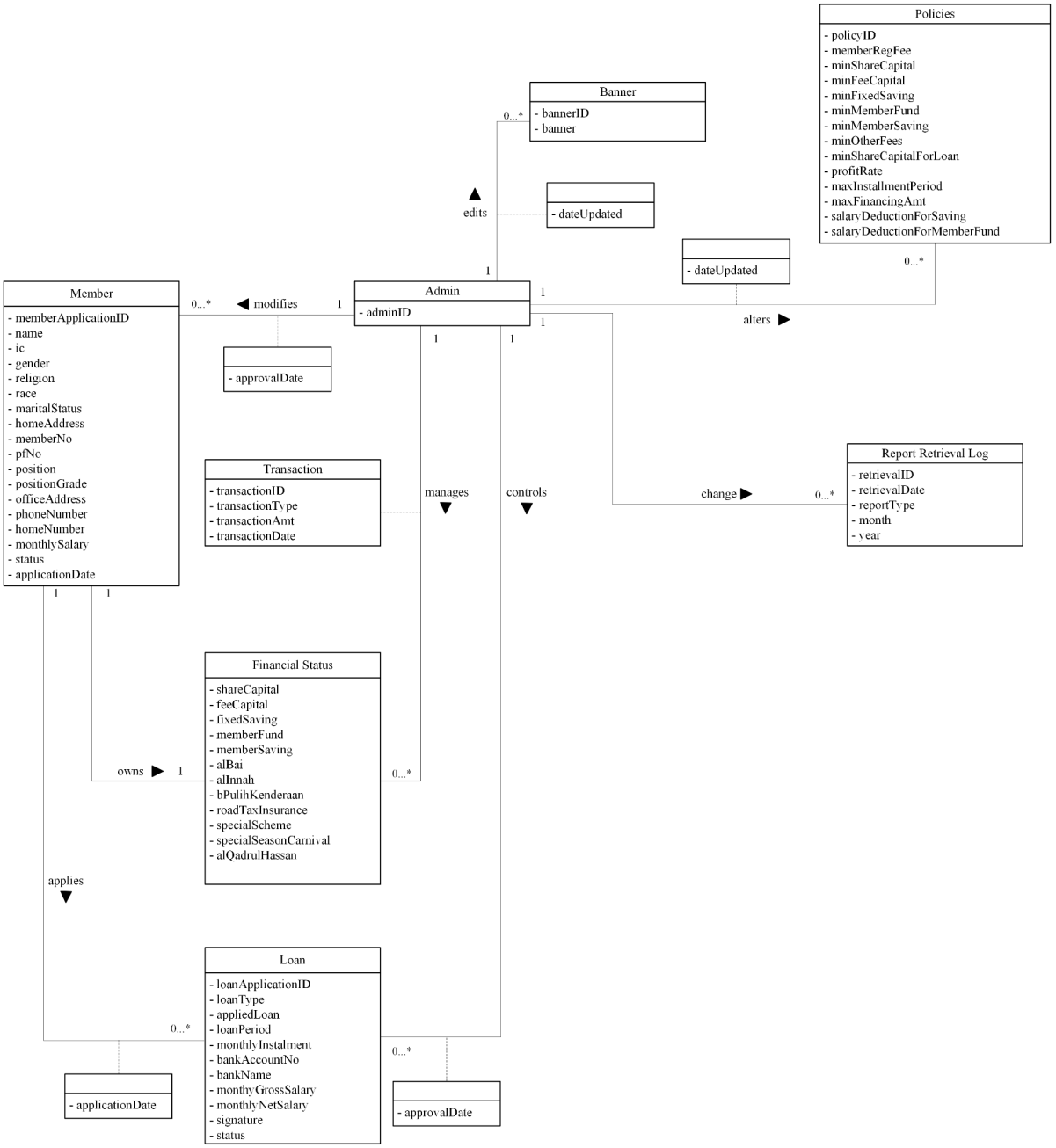

Figure 1.6 local conceptual data model for admin updating module

2.7 Module Admin Reporting

Teh Ru Qian is responsible for documenting this module.

2.7.1 Module Description

This module involves actor Admin. There are 1 use case inside this module, which is UC10 Generate Monthly and Annual Report.

UC10 Generate Monthly and Annual Report

The admin can generate monthly and annual reports that summarise the financial and membership information.

2.7.2 Transaction Requirement: Data Entry

The module does not support direct data entry. All data used in the reports is retrieved from existing system records.

2.7.3 Transaction Requirement: Data Update/Deletion

The module does not support updates or deletions. It is strictly read-only for generating reports.

2.7.4 Transaction Requirement: Data Queries

Retrieve list of member applications
Retrieve list of loan application
Retrieve list of existing members
Retrieve list of current debtors
Retrieve transaction records

2.7.5 Local Conceptual Data Model (ERD)

The local conceptual data model (ERD) of the admin reporting module is shown in Figure 1.7.

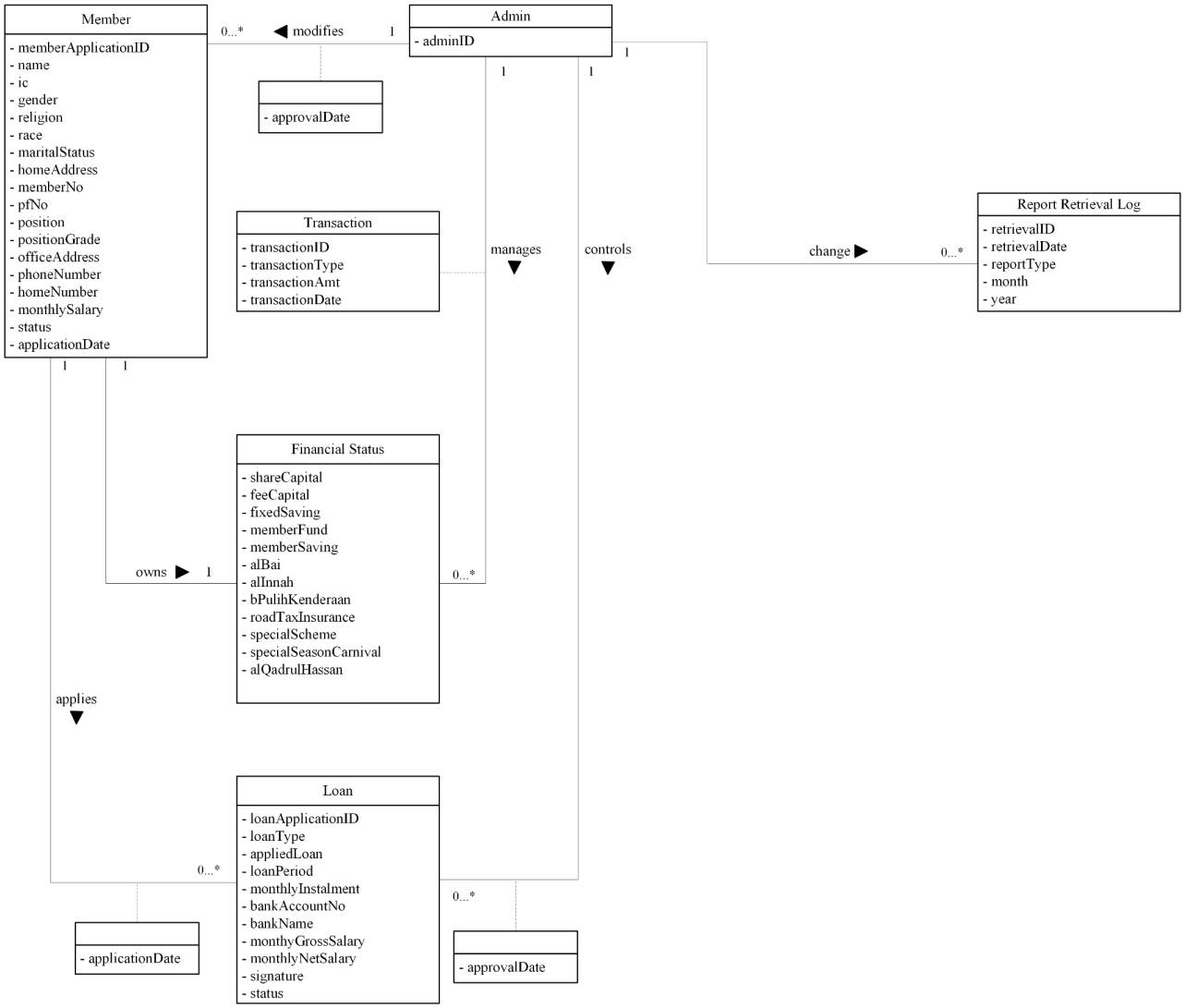

Figure 1.7 local conceptual data model for admin reporting module

3 Global Conceptual Data Model (Global ERD)

The Global Conceptual Data Model outlines the main entities of KKK system and their relationships.

3.1 Global Conceptual Design (ERD)

The global conceptual design is shown in Figure 1.8.

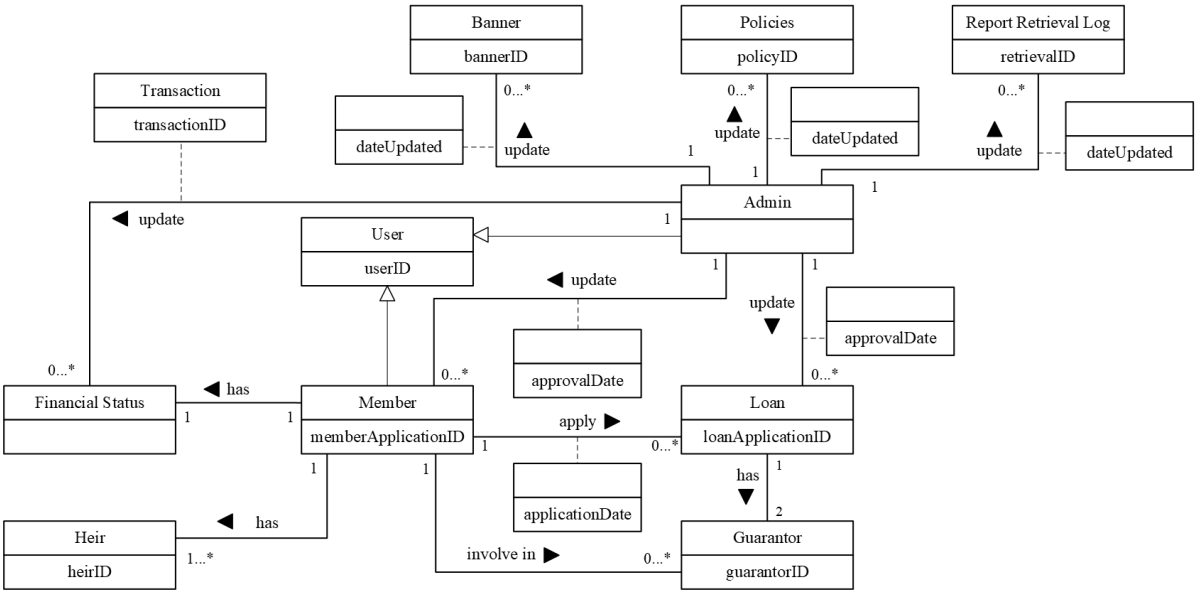

Figure 1.8 global conceptual design (ERD)

3.2 Verified Global Conceptual Design (Verified ERD)

The verified global conceptual design is shown in Figure 1.9.

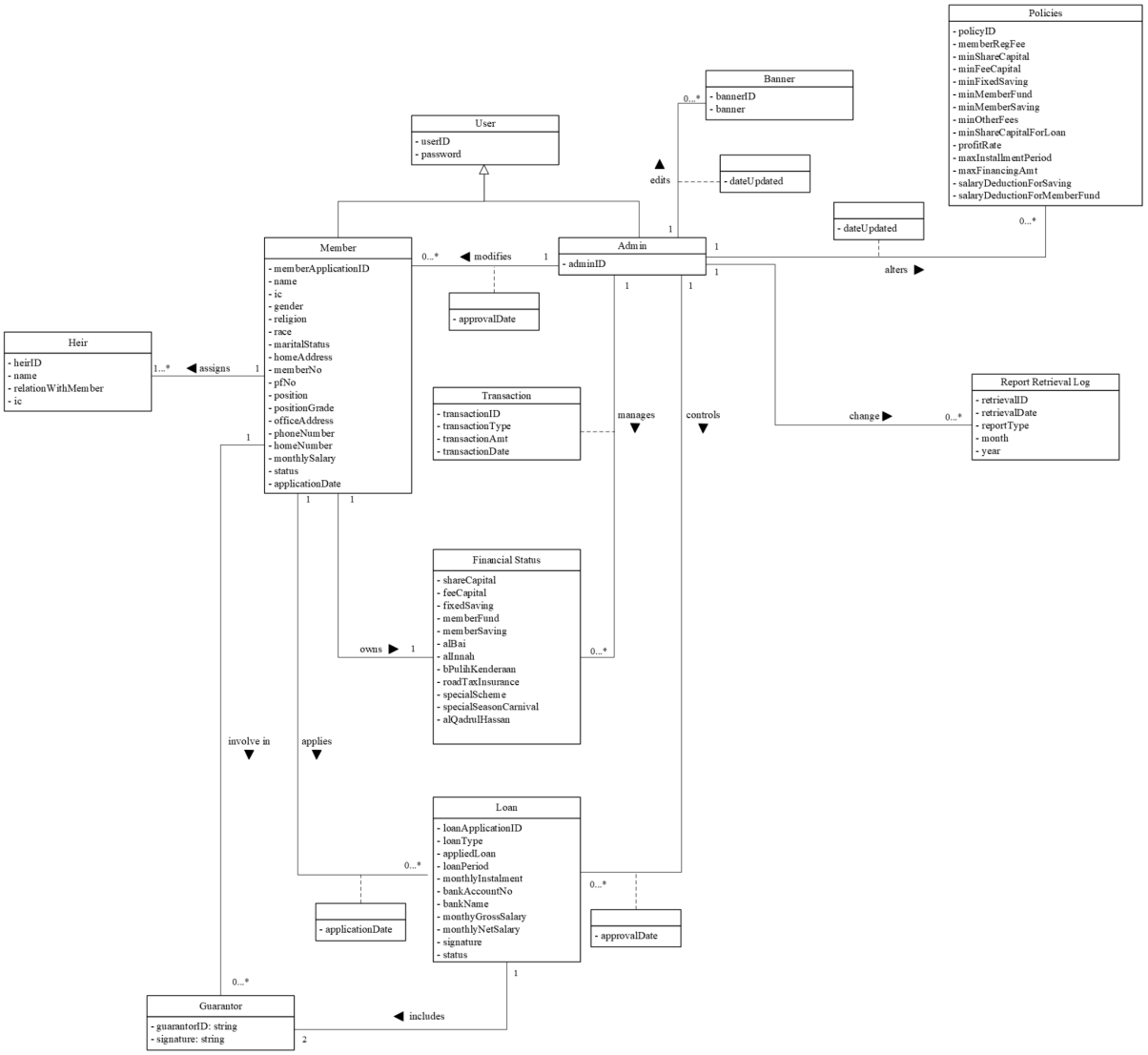

Figure 1.9 global conceptual design (verified ERD)

3.3 Data Dictionary for the global conceptual ERD

This section records the glossary specific to this global conceptual ERD.

Glossary	Meaning
ID	Identification Number
pfNo	Employees' Personal File Number
transactionAmt	Transaction amount
bPulihKenderaan	Car reparation fee
memberRegFee	Member registration fee

4 Appendices

This section provides additional information, including use case and activity diagrams to enhance understanding of the system and its development process.

4.1 Use Case Diagram for the system

The use case diagram for the system is shown in Figure 2.0.

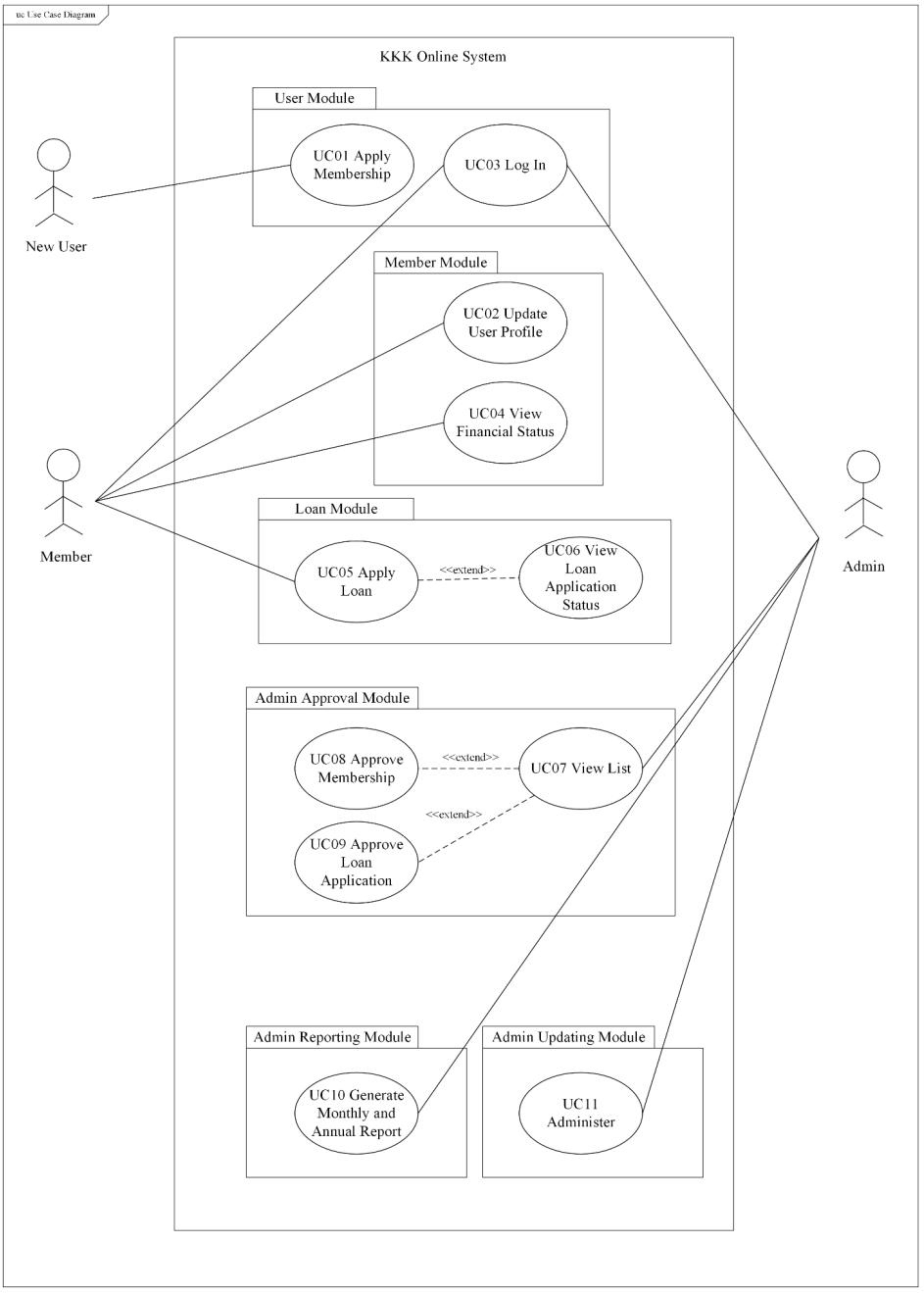

Figure 2.0 use case diagram for the system

4.2 Activity Diagrams for every use case identified

UC01 Apply Membership

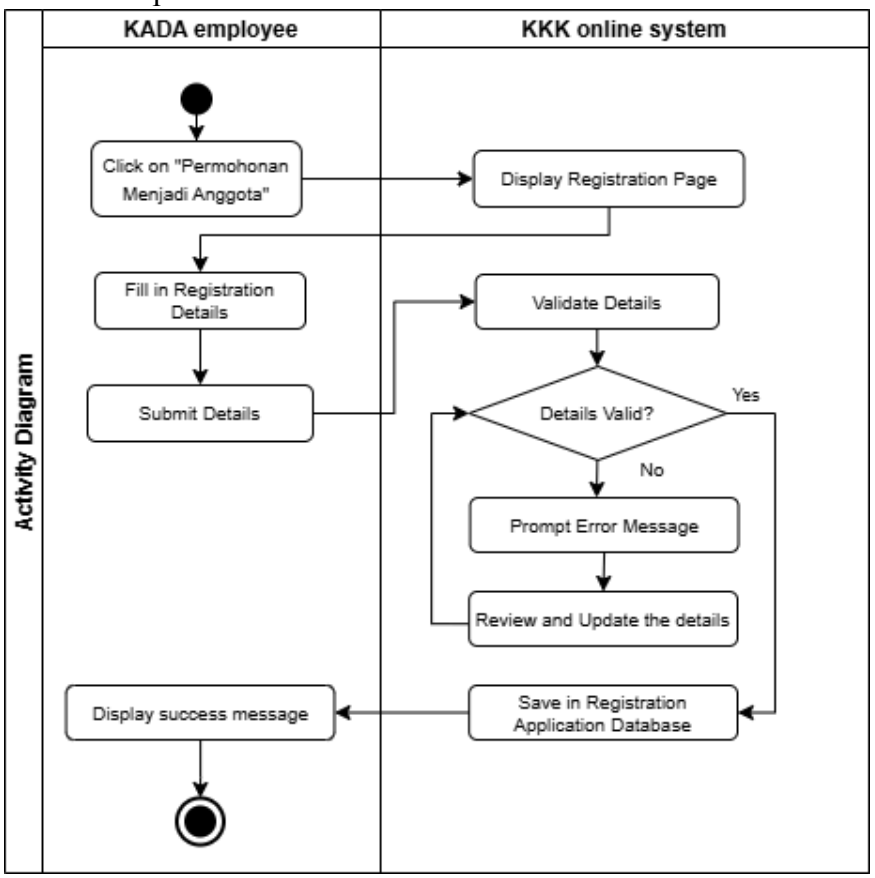

Figure 2.1: Activity Diagram for Apply Membership

UC02 Update User Profile

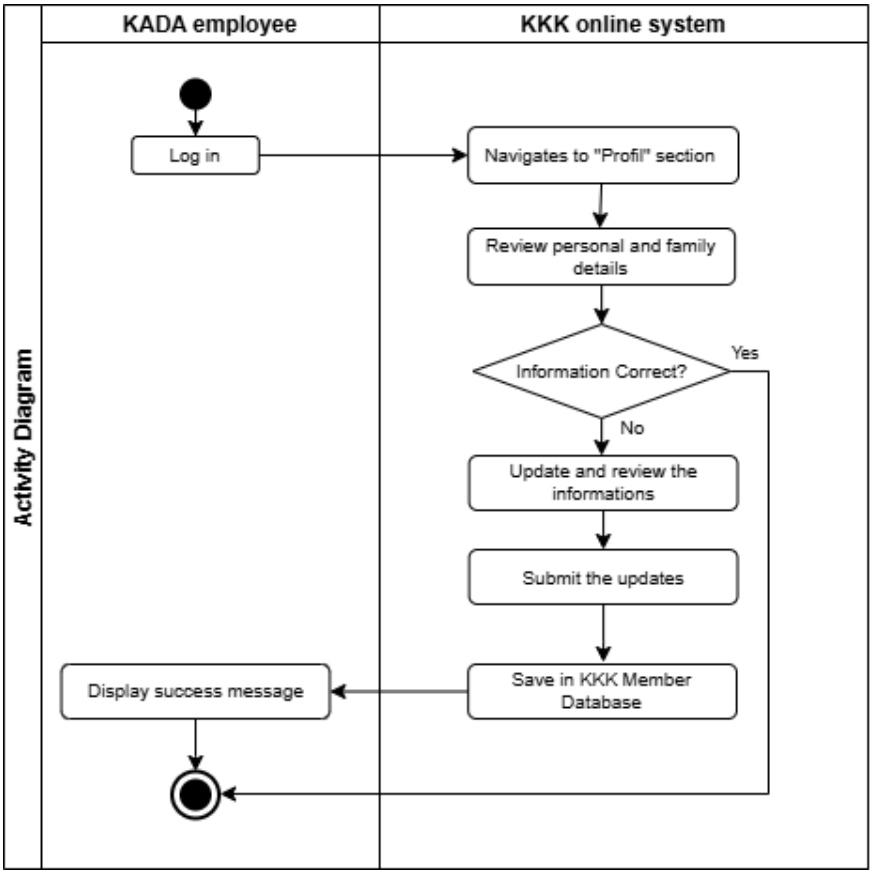

Figure 2.2: Activity Diagram for Update User Profile

UC03 View Financial Status

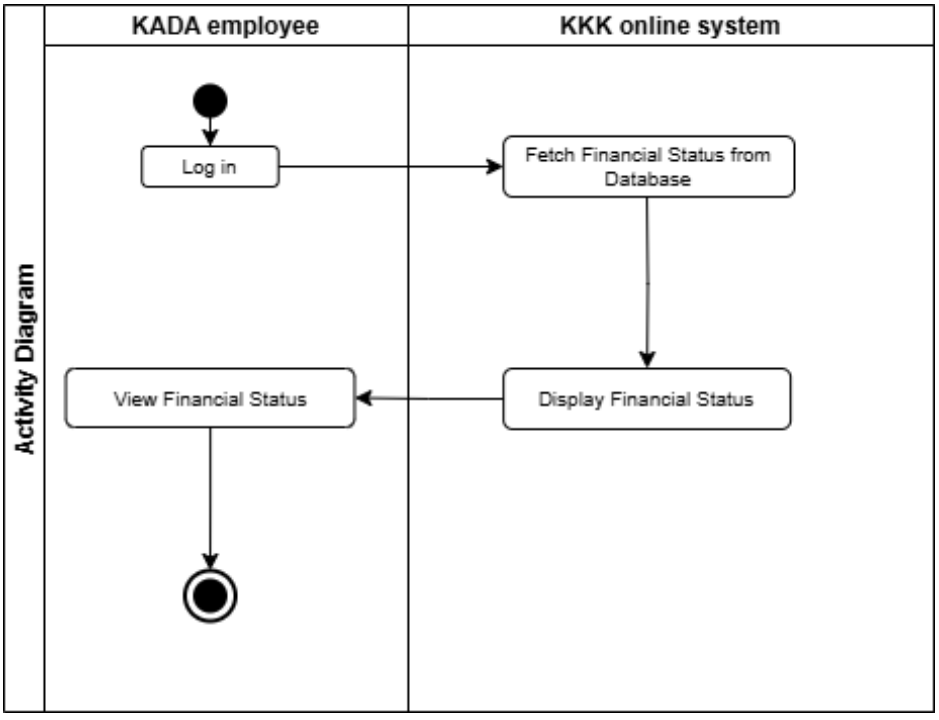

Figure 2.3: Activity Diagram for View Financial Status

UC04 Apply for a Loan

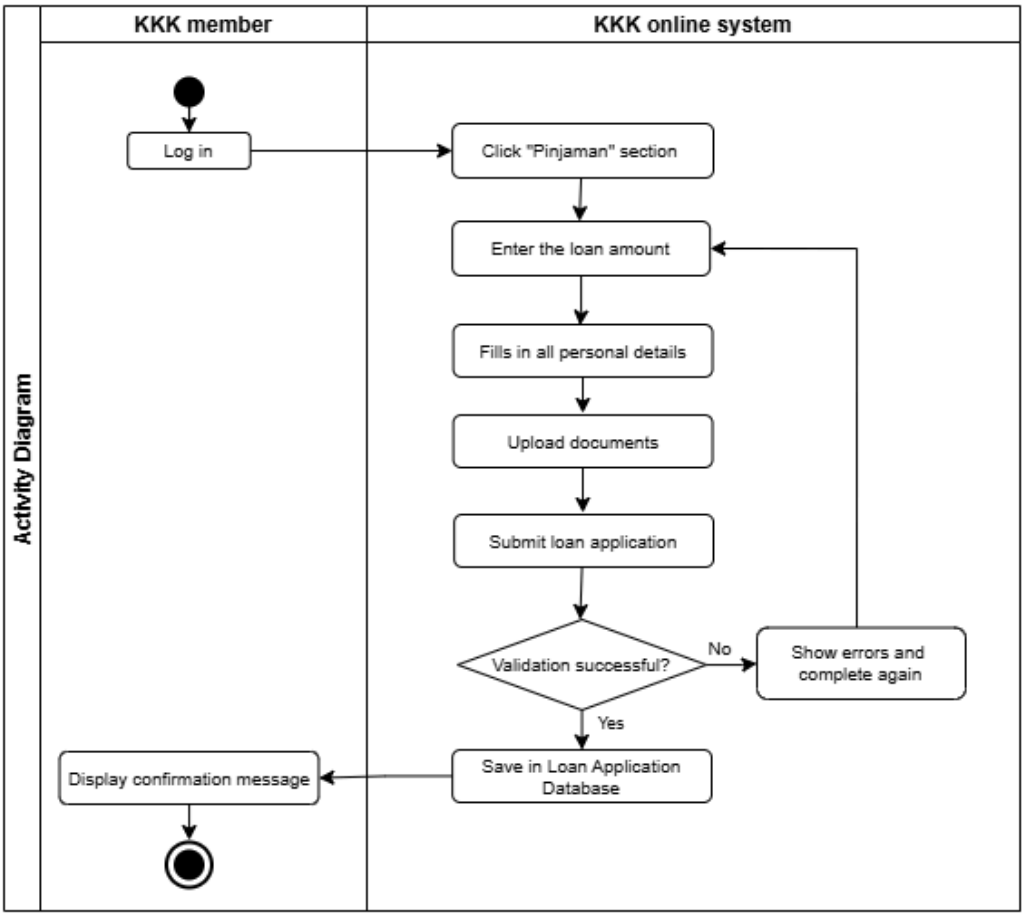

Figure 2.4: Activity Diagram for Apply for a loan

UC05 View Loan Application Status

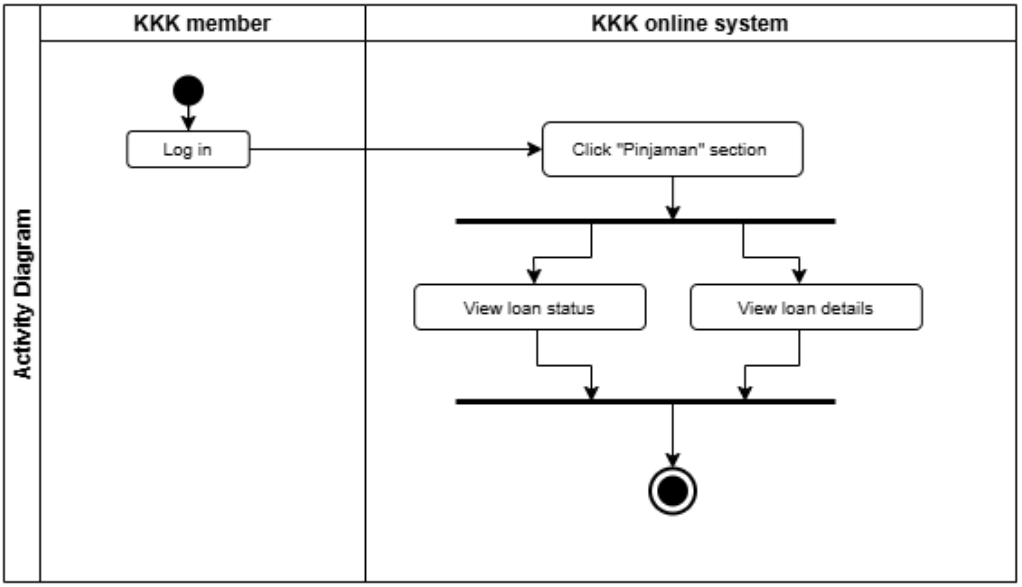

Figure 2.5: Activity Diagram for View Loan Application Status

UC06 KKK Admin Login to System

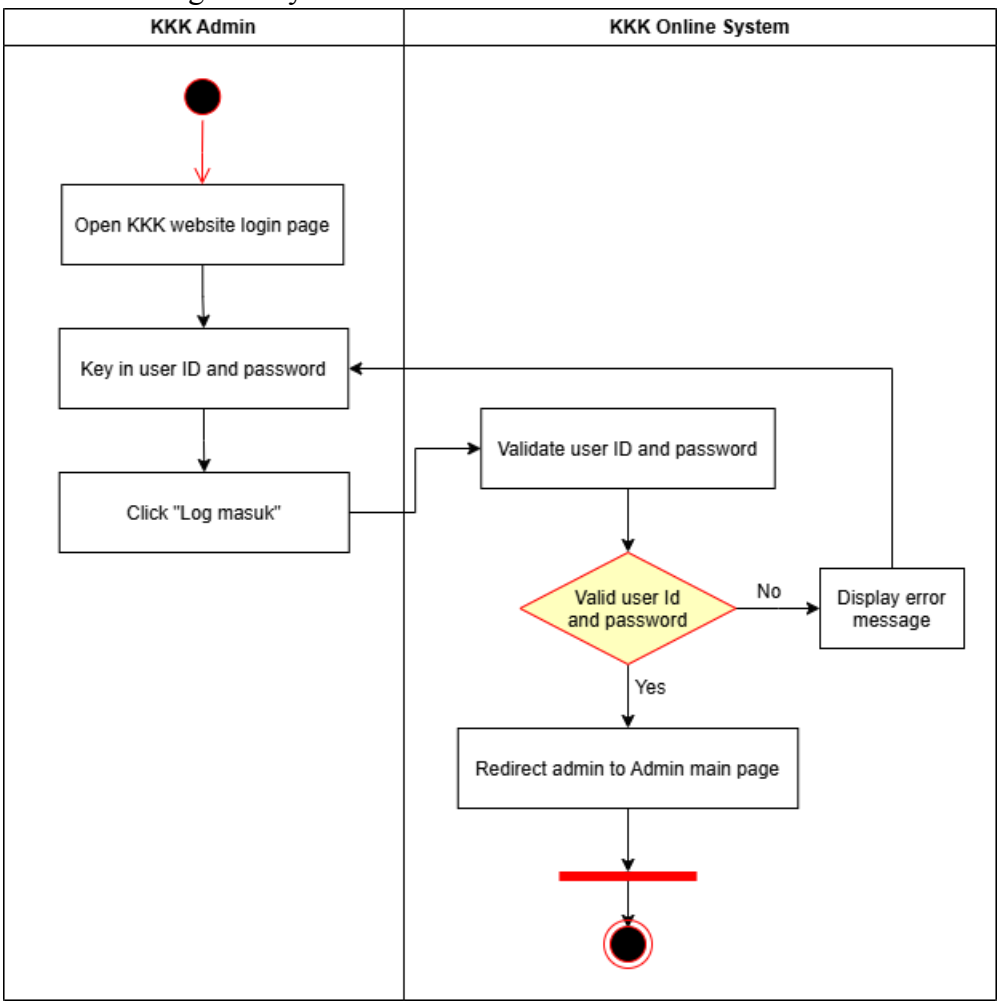

Figure 2.6: Activity Diagram for KKK Admin Login to System

UC07 KKK Admin View List

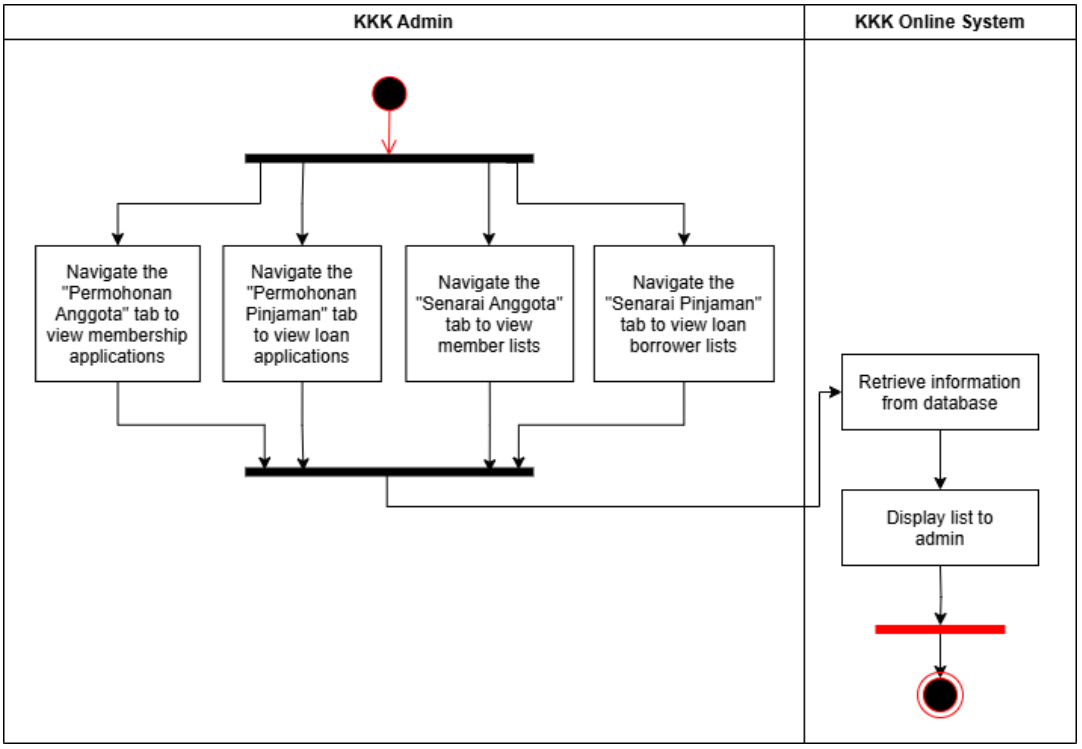

Figure 2.7: Activity Diagram for KKK Admin View List

UC08 KKK Admin Approve New Member Application

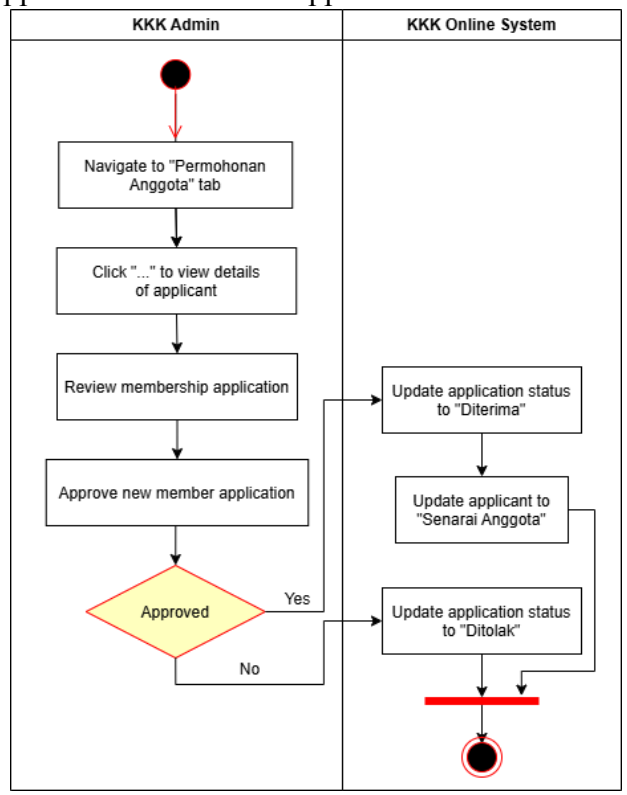

Figure 2.8: Activity Diagram for KKK Admin Approve New Member Application

UC09 KKK Admin Approve Loan Application

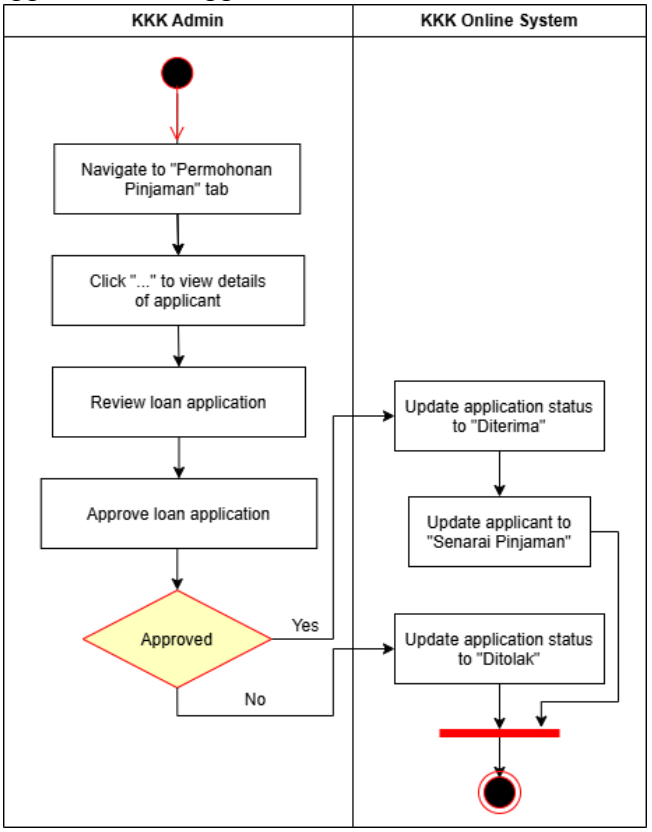

Figure 2.9: Activity Diagram for KKK Admin Approve Loan Application

UC10 KKK Admin Generate Reports

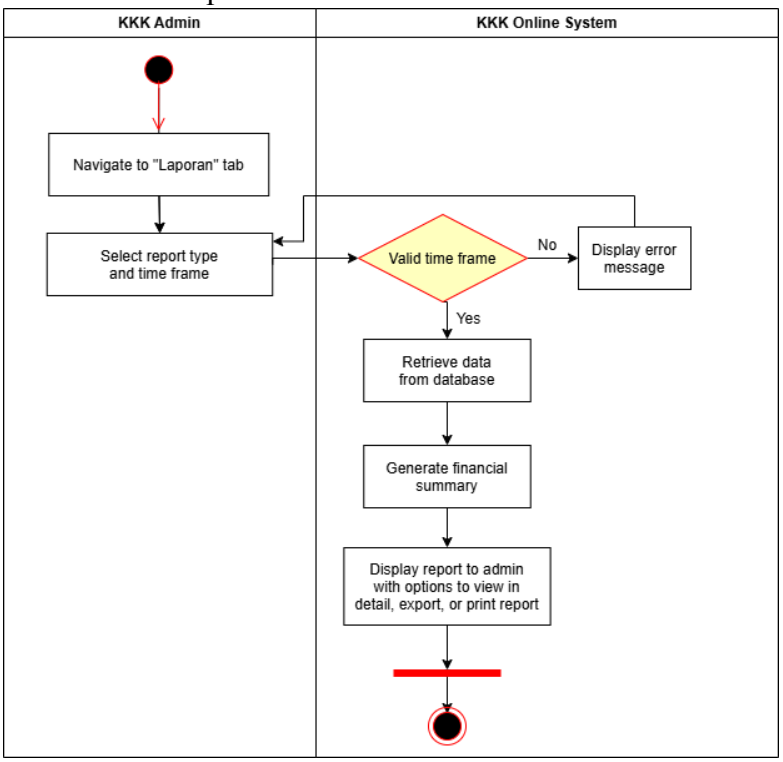

Figure 3.0: Activity Diagram for KKK Admin Generate Reports

UC11 KKK Admin Administer

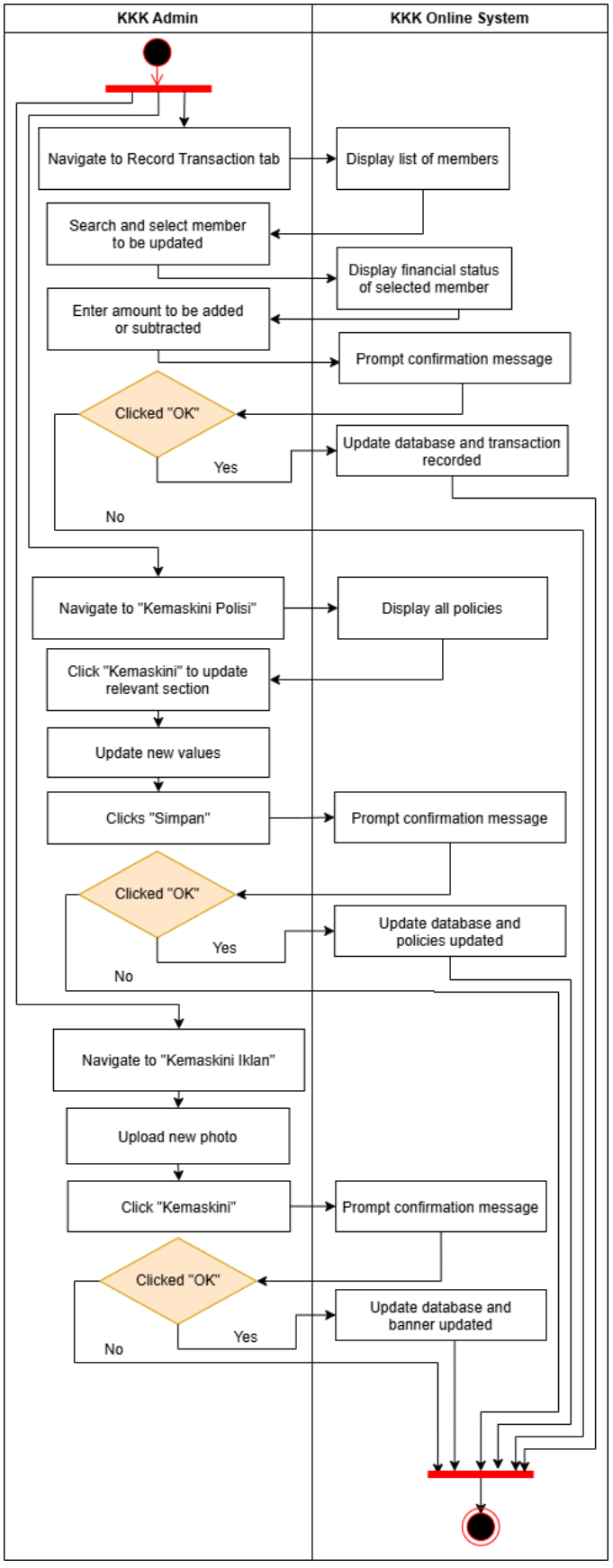

Figure 3.1: Activity Diagram for KKK Admin Administer

4.3 Meeting Log

DATE/TIME		9/12/2024	
LOCATION		MPK9, N28	
AGENDA		Discussion on determine the module	
ATTENDANCE			
NAME		**TIME**	**REASON FOR ABSENCE**
Chua Jia Lin		4.20pm	-
Goe Jie Ying		4.20pm	-
Lam Yoke Yu		4.20pm	-
Tan Yi Ya		4.20pm	-
Teh Ru Qian		4.20pm	-
MEETING			
NO.	**ITEM DISCUSSED**	**IDEA/SUGGESTIONS AND PERSON GIVING IT**	**PERSON IN CHARGE & DATE**
1	Determine the module	Yoke Yu ● Suggest dividing the admin module into three parts based on functionality.	All 9/12
2	Task Distribution	Ru Qian ● In charge of admin updating and reporting module ● Write introduction and appendices Yi Ya ● In charge of loan module ● Design Global ERD Jie Ying ● In charge of member module ● Design Global ERD Yoke Yu ● In charge of user module ● Design Global ERD Jia Lin ● In charge of admin approval module	All 9/12

3	Next Meeting	14/12 - Progress Checking	All
4	Meeting Ended	5.00 pm	All